Bergenfield High School
Bergenfield, New Jersey

Mathematics Department

Summer Course Work

in preparation for

AP PreCalculus

Completion of this summer work
is required on the first day of the
2023-2024 school year.

Name: _____

Bergenfield Public Schools
Mathematics Department
80 South Prospect Avenue
Bergenfield, New Jersey
(201) 387-3850

June 2023

Dear Parents and Guardians:

We are excited again to present summer activities that the math teachers of Bergenfield High School have created. Enclosed are math activities designed to help your son or daughter practice the skills which they have already learned and are critical to success in this course. As you may be aware, studies have shown that students who do not practice or review during the summer months the material they have already mastered lose some of that mastery. Unfortunately, this then requires the next teacher to spend valuable teaching time reviewing. While certainly not the final answer, this packet of activities is designed to help your son or daughter retain his or her math skills and knowledge.

Like you, we want your child to enjoy a wonderful summer. That is why we have designed activities so that 20 to 30 minutes of work per week should be all that is required. We urge you to encourage your child to take this task seriously and complete it successfully. Together we can make a difference in your child's future. Now is the time to build on the foundation to help your child succeed on future standardized exams, placement tests, and even more importantly, assessments at a college level.

These activities will reinforce skills that were taught in previous courses. **This assignment should be completed and brought to the first day of the school in September.** Calculators are NOT to be used to complete this project except where noted. *Please read all directions carefully.*

We wish you a wonderful and safer summer.

Sincerely,

Jim Fasano
Principal

Steven Neff
Supervisor of Mathematics

Honors PreCalculus Summer Review Packet

This packet is a review of information you learned in Algebra, Geometry, & Advanced Algebra. You need to know this information to be successful in PreCalculus. Therefore, this packet is due on your **FIRST DAY IN PRECALCULUS**. It is to be completed CORRECTLY, NEATLY, and on SEPARATE sheets of paper.

Your PreCalculus teacher will collect your work on your **FIRST DAY IN PRECALCULUS**. Failure to turn in your completed work on your **FIRST DAY IN PRECALCULUS** may jeopardize your ability to remain in the course.

LINEAR EQUATIONS

https://www.khanacademy.org/math/algebra/two-var-linear-equations#forms-of-two-var-linear-equations

Write the appropriate Linear Equation for each of the following.

1. The point-slope form given $(-3, 10)$ with $m = -4$.

2. The standard form given $(-2, 6)$ & $(5, 2)$.

3. The slope-intercept form given $(-1, -5)$ & $(6, 0)$.

4. The slope-intercept form given $(6, -5)$ & perpendicular to $-5x - 7y = -17$.

5. The standard form of the line parallel to the given line $y = 3x$.

SOLVING LINEAR EQUATIONS

https://www.khanacademy.org/math/algebra/one-variable-linear-equations

Solve each Linear Equation for the stated variable.

6. Solve for x.
$5x + 3(x - 2) = 4x + 1$

7. Solve for m.
$g = 4cm - 3m$

8. Solve for x.
$-(1 + 7x) - 6(-7 - x) = 36$

LINEAR SYSTEMS

https://www.khanacademy.org/math/algebra/systems-of-linear-equations

Solve the following Linear Systems.

9. $3x + 4y = 12$
$2x - 3y = -9$

10. $2x + 9y - 5 = 0$
$5y - x = 26$

11. $y = \frac{2}{3}x + \frac{7}{3}$
$6y - 4x = 14$

12. The school that Stephan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of \$38. The school took in \$52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

13. For what value of b would the following system of equations have an infinite number of solutions?
$9x + 12y = 21$
$6x + 8y = 7b$

QUADRATICS

https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-by-completing-the-square/v/solving-quadratic-equations-by-completing-the-square

Solve by completing the square.

14. $x^2 + 10x - 25 = 0$

15. $x^2 + 15 = 8x$

Solve the equation using the quadratic formula.

https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-using-the-quadratic-formula/v/quadratic-formula-1

16. $2x^2 - 14x + 40 = 3x^2 - 16x + 32$

17. $x^2 - 4 = 3x$

Solve the equation by factoring.

https://www.khanacademy.org/math/algebra/polynomial-factorization

18. $4x^2 - 1 = 0$

19. $x^2 + 3x = 10$

20. $5x^2 - 32x - 21 = 0$

21. $x^2 - 11x + 19 = -5$

22. $27x^2 + 18x = 0$

23. $2x^2 + 20x + 12 = 5x - x^2$

Solve by using your Graphing Calculator. Round answers to the nearest thousandths (3 decimal places).

https://www.youtube.com/watch?v=JHUju_Qkqbg

24. $x^2 - 8x = -18$

25. $13x^2 + 24x - 1 = 14$

DOMAIN & RANGE

https://www.khanacademy.org/math/algebra/algebra-functions#domain-and-range

Determine the domain and range of the following relation or function.

26. $(1,2), (-3,8), (-9,6), (\frac{1}{2}, 5)$

27. $y + 9x = 15$

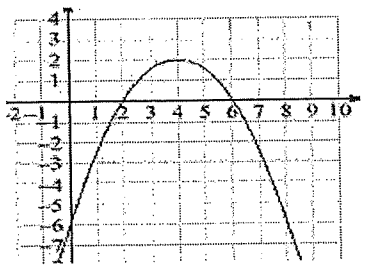
28. $y = x^4 + 3x^3 - x^2 - 5x$

29. $y = \sqrt{x+1} - 3$

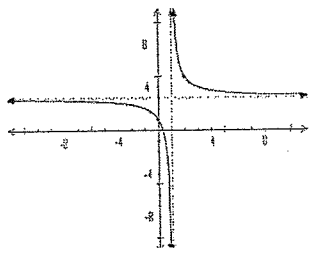
30. $y = 6 - |x|$

31. $y + 3x^2 = x - 2$

32.



33.



OPERATIONS WITH EXPONENTS

https://www.khanacademy.org/math/algebra/rational-exponents-and-radicals#alg1-exp-prop-review

Simplify the following expressions; assume no variable is equal to zero.

34. $(2x^4)^{-3}$

35. $\left(\frac{3}{x^{-3}}\right)^7$

36. $\frac{5x^3y^9}{30x^4y^{-2}}$

37. $\frac{xy^9}{2y^2} \cdot \frac{-7y}{21x^{-5}}$

38. $\left(x^{\frac{5}{3}}y\right)(x^{-4}y)^{\frac{1}{2}}$

RATIONAL EXPRESSIONS

https://www.khanacademy.org/math/algebra2/rational-expressions-equations-and-functions

Factor and/or Reduce the following Rational Expressions.

39. $\frac{x^2+x-6}{x^2-4}$

40. $\frac{x^2+x-12}{5x-15}$

Complete each rational operation.

41. $\frac{3}{x+5}-\frac{x}{5}$

42. $\left(\frac{3x^2+7x-6}{9x^2-4}\right)\cdot\left(\frac{15x^2+4x-4}{9-x^2}\right)$

43. $\frac{\frac{x^2-1}{5x}}{\frac{x+1}{5x^2+10}}$

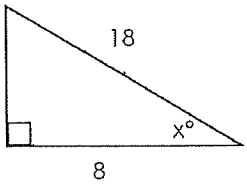
44. For which nonnegative value of x is the expression $\frac{5+x}{25-x^2}$ undefined?

RIGHT TRIANGLE TRIGONOMETRY

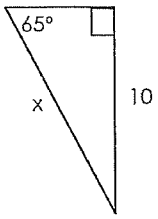
Using right triangle trigonometry, determine the measure of the missing side or angle. Round answers to the nearest thousandths (3 decimal places).

https://www.khanacademy.org/math/trigonometry/trigonometry-right-triangles

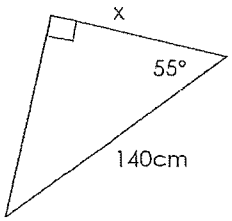
45.



46.



47.



48. Find to the nearest degree, the measure of the smaller acute angle of a right triangle whose sides are 7, 24, and 25.

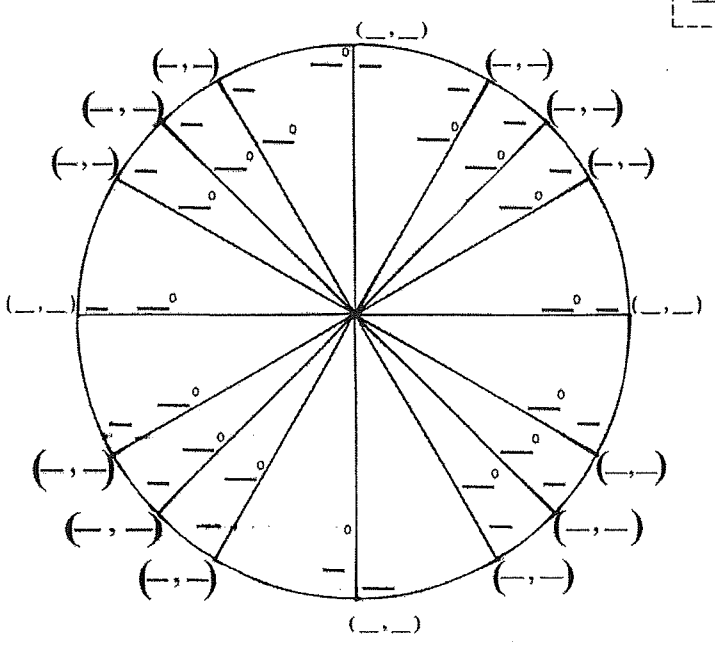
49. A man standing 24 feet from a flagpole observes the angle of elevation of its top to be 38°. Find the height of the flagpole to the nearest tenth.

TRIGONOMETRIC FUNCTIONS

https://www.khanacademy.org/math/trigonometry/unit-circle-trig-func

Without any aids, fill in the Unit Circle.

50.



Without a calculator, determine the exact value of each expression.

51. $\sin\frac{\pi}{2}$

52. $\sin\frac{3\pi}{4}$

53. $\cos 180°$

54. $\cos\frac{7\pi}{6}$

55. $\cos 60°$

56. $\tan\frac{7\pi}{4}$

57. $\tan\frac{2\pi}{3}$

58. $\tan\frac{\pi}{2}$